2 Sheets. Sheet 1.

J. M. Riley,

Spring Hinge.

No. 50,423. Patented Oct. 10, 1865.

Fig: 1.

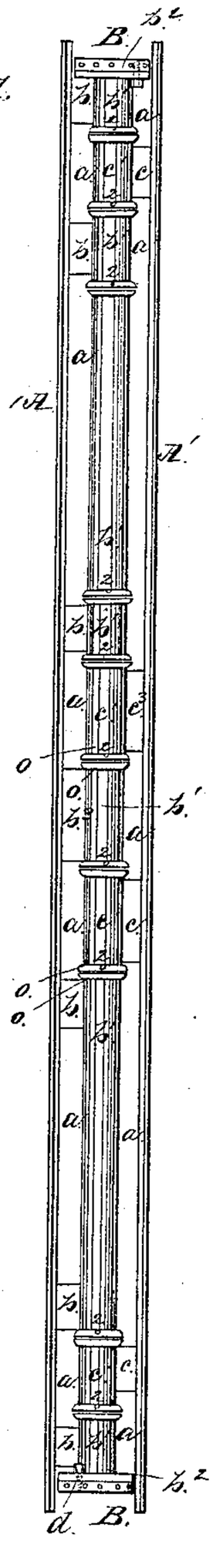
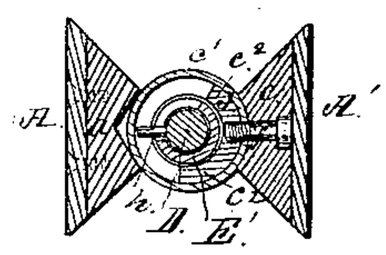


Fig: 3.



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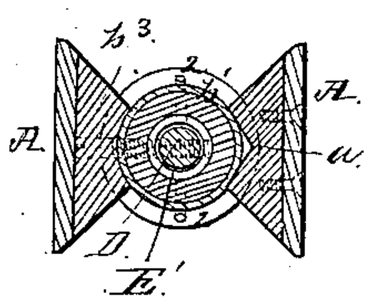

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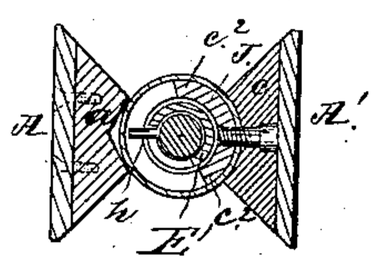
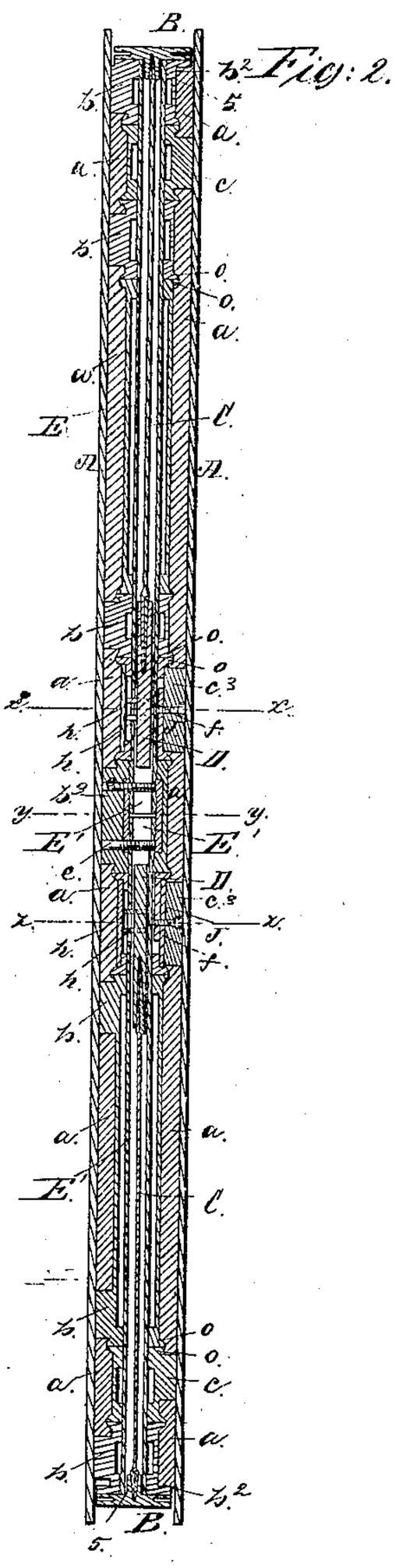


Fig: 2.



Witnesses:

Wm Dean Overall

Thos Tusch.

Inventor:

J. M. Riley

per Munn & Co.

attorneys

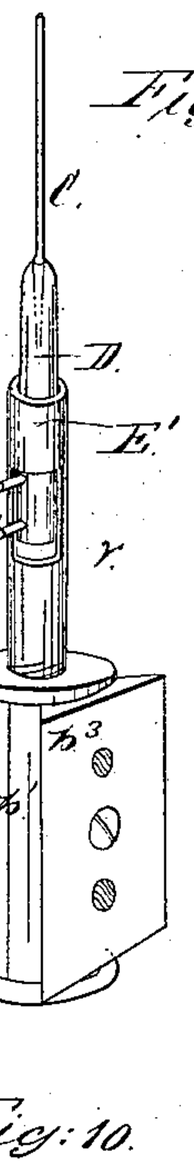
2 Sheets-Sheet 2.

J. M. Riley,

Spring Hinge.

No. 50,423. Patented Oct. 10, 1865.

Fig: 6.



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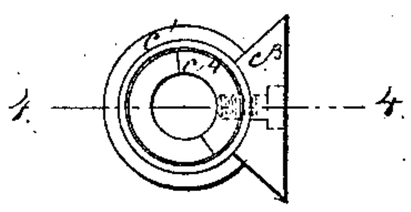

Fig: 8.

Fig: 9.

Fig: 10.

Fig: 11.

Fig: 12.

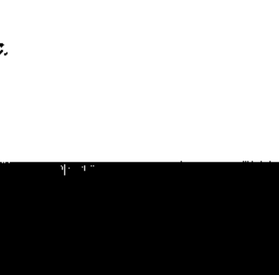

Fig: 13.

Witnesses:

Wm. Dean Worrell

Thos. Tusch.

Inventor.

J. M. Riley

per Munn & Co

Attorneys

UNITED STATES PATENT OFFICE.

J. M. RILEY, OF NEWARK, NEW JERSEY, ASSIGNOR TO HIMSELF AND W. A. SCHMIDT, OF SAME PLACE.

IMPROVEMENT IN HINGES.

Specification forming part of Letters Patent No. **50,423**, dated October 10, 1865.

To all whom it may concern:

Be it known that I, J. M. RILEY, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Door-Hinges; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an elevation of a hinge made after my invention. Fig. 2 is an axial section. Figs. 3, 4, and 5 are cross-sections taken on the lines *x*, *y*, and *z* of Fig. 2, respectively. Fig. 6 is an elevation of the central butt, b^3, with part of the spring, its key, and inclosing-tube. Figs. 7, 8, and 9 are detailed views of one of the butts which actuates the spring of the hinge. Figs. 10 and 11 are detailed views of one of the nuts, B. Figs. 12 and 13 are detailed views of the top of the inclosing-tube at the upper end of the door and of the butt connected to it.

Similar letters of reference indicate like parts.

This invention consists of a spring door-hinge which closes the door by automatic action. It is of a length about equal to the door, and it is so made as to conceal the spring and the parts which actuate it and are actuated by it, so that they are protected from the weather.

A A′ are metallic base-plates which support the butts *b c* b^3 c^3, and by which the hinge is attached to the door and its casing. E′ E′ are tubes set end to end but not in contact with each other. Their united length is the length of the hinge. Their outer ends are fixed to the butts *b* at the end of the hinge by means of a screw-thread connection or otherwise, and their inner ends are fixed to the central butt, b^3, in a similar manner. The nuts B have hubs 5, which fit loosely in the ends of the tubes E′. These hubs are mortised to receive the end of the spring-rods C, by whose torsion the hinge is made to operate to keep the door closed, as hereinafter explained.

The letters *b c* designate butts, which are connected either to the door or door-casing. Those butts *b* which are at the ends of the hinge are fitted to the outer ends of the tubes E′ by means of screw-threads, and those butts have flanges b^2, of equal diameter with the nuts B, to which they are connected by set-screws *d*. They are not so connected, however, until the spring-rods C are properly set, or, in other words, have the desired torsion given to them by the rotation of the nuts B. The other butts are designated by the letters b^3 c^3. These and the butts *b c* are fixed to outer cylinders, *b′ c′*, respectively, which inclose the tubes E′. All the butts are connected to the base-plates A A′.

The inner ends of the springs C are fixed in mortises made in the keys D. The keys have rotary motion in their tubes E′, their motions being limited by pins *h h*, which project laterally from the keys through slots V made in the tubes. Said slots measure about one-fourth of the circumference of the respective tubes, and one of them is seen in Fig. 6. The inner ends of the tube E′ are screwed into the central butt, b^3, of the hinge, whose sides are made thicker than the sides of the other, *b c*. The inner ends of the tubes are further secured to the said central butt by means of screw-bolts *e e*, which pass through them from the back side of the butt, so that said tubes and the butt b^3 have no motion one upon the other. c^3 c^3 are the butts which inclose the pins *h h*, and which actuate the spring-rods through them. The pins *h* may be made continuous and single—that is, of one flat piece—if desired. J J are semicircular plates fitted within the cylinder *c′* of the butt c^3 and fixed securely to them by screws *f*. The edges of said plates J are designated by the letters c^2.

O O are collars placed about the tubes E′ at the ends of the outer cylinders, *b′ c′*. These collars form the joints of the latter cylinders, and they may either be parts thereof or they may be separate pieces, and the ends of said cylinders be soldered on the smaller ends of the collars or driven on them so tightly that they will move together. The ends of each pair of collars may be protected by washers, if desired. The collar at the lower end of each of the outer cylinders has an oil-hole, 2, to enable one to lubricate the joints and the collars, so that they may have easy motion upon the tubes E′. Those butts which occur between the butts c^3 and the outer butts, *b*, and which

fill up the intervening space, serve to support the door and sustain the tubes E′ by means of their respective cylinders *b′ c′*.

The letter *a* designates wood, which I have used in this example to fill up the spaces which intervene between the outer cylinders, *b′ c′*, and the plates A A′.

The operation of the hinge is as follows: The several parts are connected to each other in the relations shown in Fig. 2, the lower spring-rod, C, and its appurtenances being so arranged that the torsion put upon it shall be in a direction opposite to the torsion put upon the upper spring. The torsion is effected by means of the nuts B, which are turned until they bring the pins *h* against the edges of the slots V of the inner tubes E′, at which time, also, they will strike against the edges c^2 of the plates J, the plates J being so arranged as to bring the parts to this position when they are put together.

Figs. 3 and 5 illustrate the condition to which these parts are to be brought, or, in other words, their relations to each other, although the pins *h* are not shown in those figures in the right positions to be acted on by the plates J. The movement of the door upon its hinges is supposed, in this example, to be about ninety degrees in either direction. When it is pushed in either direction one of the plates J drives the pins *h* through or across the slot V until they reach its opposite edge, when the door will have moved through about one-quarter of a circle. This action puts an increased torsional strain upon the rod, whose other end is held fast in the hub 5 of the nut, which nut is held fast or stationary by means of the flange of the adjacent butt, *b*, which butt is fast on the end of the tube E′. These tubes E′ do not revolve with the door, but are held stationary within the cylinders *b′ c′*. When the door is released the elasticity of the rod C′ causes the pins *h* to push the plate J back to its normal position. The opening of the door in the opposite direction operates the other plate J and its appropriate pins *h* and spring C. An equal tension or torsion is to be made on the springs C C when the hinge is adjusted for use, so that they will have equal pressure upon the several plates J J, and thereby keep the opposite parts of the hinge in equilibrium, so that the door will always remain closed. The tubes E′ may be joined so as to form a single tube instead of being divided.

All the operative parts of the hinge are concealed from view and from exposure in the construction here shown.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. Constructing a continuous door-hinge in the manner and for the objects herein described and represented.

2. The key D of the spring-rod and its pins *h*, in combination with the slot V of the tube E′, substantially as above described.

3. The combination of the semicircular plate J of the butt c^3 with the key D of the spring-rod, substantially as described.

JOHN M. RILEY.

Witnesses:
W. BRADSHAW,
P. N. PRYERSON.